



San Mateo Creek Basin

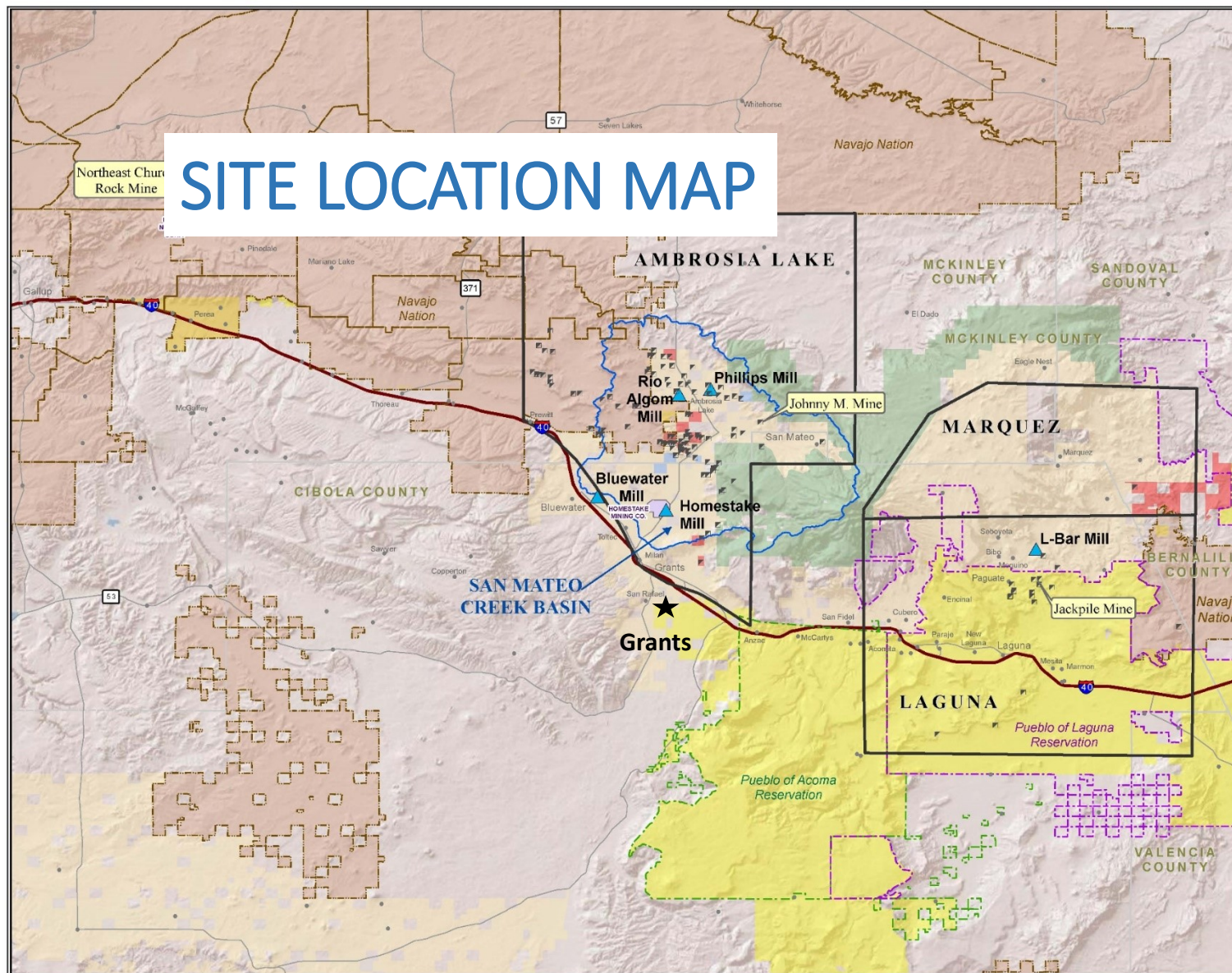
Acoma Pueblo Consultation

May 8, 2018

Legacy of Uranium Mining in Northwestern New Mexico



SITE LOCATION MAP



- Uranium Mine
- ▲ Mill Location
- City or Town
- ▭ Uranium Sub-District
- ▭ Pueblo of Acoma
- ▭ Pueblo of Laguna
- ▭ Navajo Nation Chapter
- ▭ Navajo Nation Ownership
- ▭ San Mateo Basin
- ▭ NPL Site
- ▭ County
- Land Ownership for Tracts with Mines**
- ▭ Bureau of Land Management
- ▭ Forest Service
- ▭ Tribal Land
- ▭ Private Land
- ▭ State Land

Note:
The Land Ownership layer as displayed is not complete.
The only areas displayed are those containing one or more mines.

Sources:
MMD Legacy Uranium Mine Inventory, 12/2008.
EPA Region 6 National Priorities List (NPL), 5/2015.
Bureau of Land Management (BLM) Land Ownership.
Navajo Land Department 2016, Census Bureau 2000
TIGER/Line, ESRI World Shaded Relief.

0 5 10 15 20
Miles



EPA Region 6
Superfund
GIS Support
04/25/2016



20160425/EL01

Why NPL Listing is Needed



- Only means to ensure protection of drinking water supplies
 - Private water wells
 - Municipal water supplies for Milan and Grants

Purpose of NPL



- Comprehensive approach to address threats to drinking water
- Engage responsible parties and stakeholders

San Mateo Creek Basin Background



- Area of significant uranium mining and milling
 - Began in late 1950s
 - Over 90 legacy uranium mines and 4 uranium mills
 - Thousands of exploratory boreholes drilled
 - Underground workings dewatered at many mines
- Mine water discharged to surface drainages
 - Over 3 decades of operations
 - Untreated until late 1970s



SITE MAP

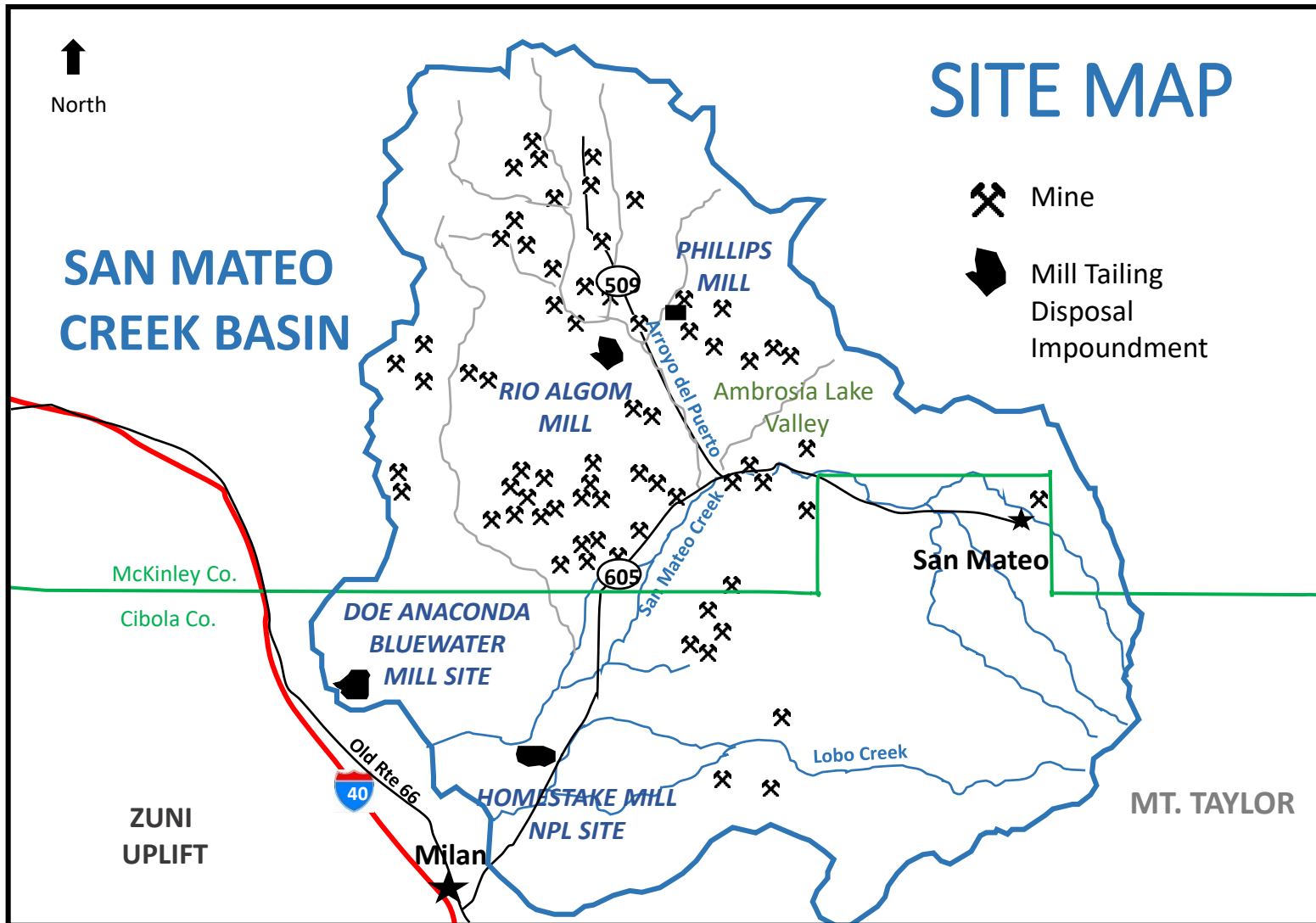


Mine



Mill Tailing
Disposal
Impoundment

SAN MATEO CREEK BASIN



San Mateo

MT. TAYLOR

McKinley Co.
Cibola Co.

ZUNI
UPLIFT

DOE ANACONDA
BLUEWATER
MILL SITE

HOMESTAKE MILL
NPL SITE

PHILLIPS
MILL

RIO ALGOM
MILL

Arroyo del Puerto
San Mateo Creek

Ambrosia Lake
Valley

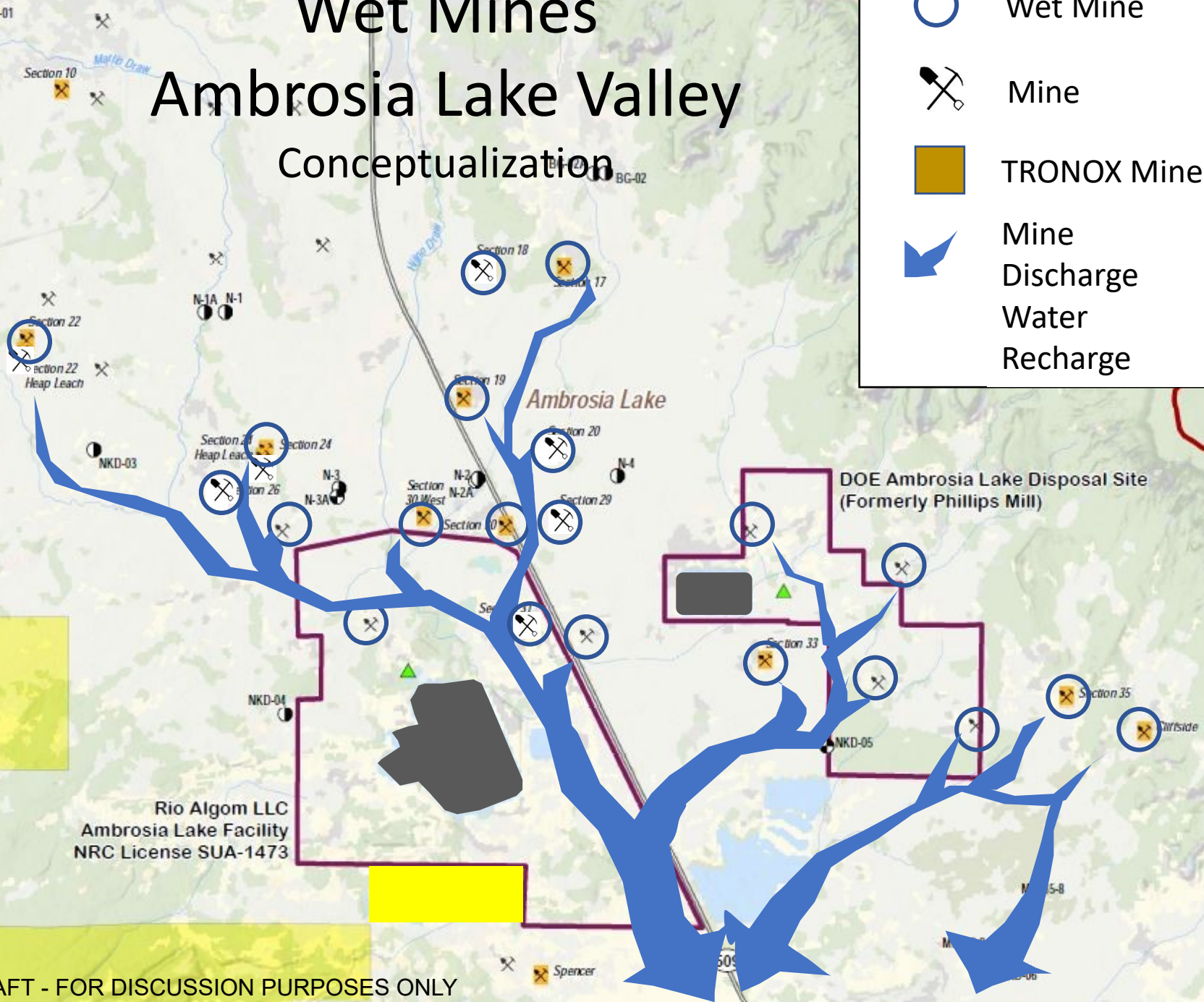
Lobo Creek

Milan

Old Rte 66
40

Wet Mines Ambrosia Lake Valley Conceptualization

-  Wet Mine
-  Mine
-  TRONOX Mine
-  Mine Discharge Water Recharge



DRAFT - FOR DISCUSSION PURPOSES ONLY

San Mateo Creek Basin Ground Water Investigations



- **EPA Fund Lead Activities**

- **\$1.7 M** Spent through FY17
- 2008-2010 New Mexico Environment Department – PA, SI, and Pre-Screens)
- 2010-2011 Documented Release Sampling Reports (2 Tronox)
- 2012-2016 Phase 1 Ground Water Investigation
- 2016-present Hazard Ranking System (Region and HQ)

- **Tronox Funded Phase II Ground Water Investigation**

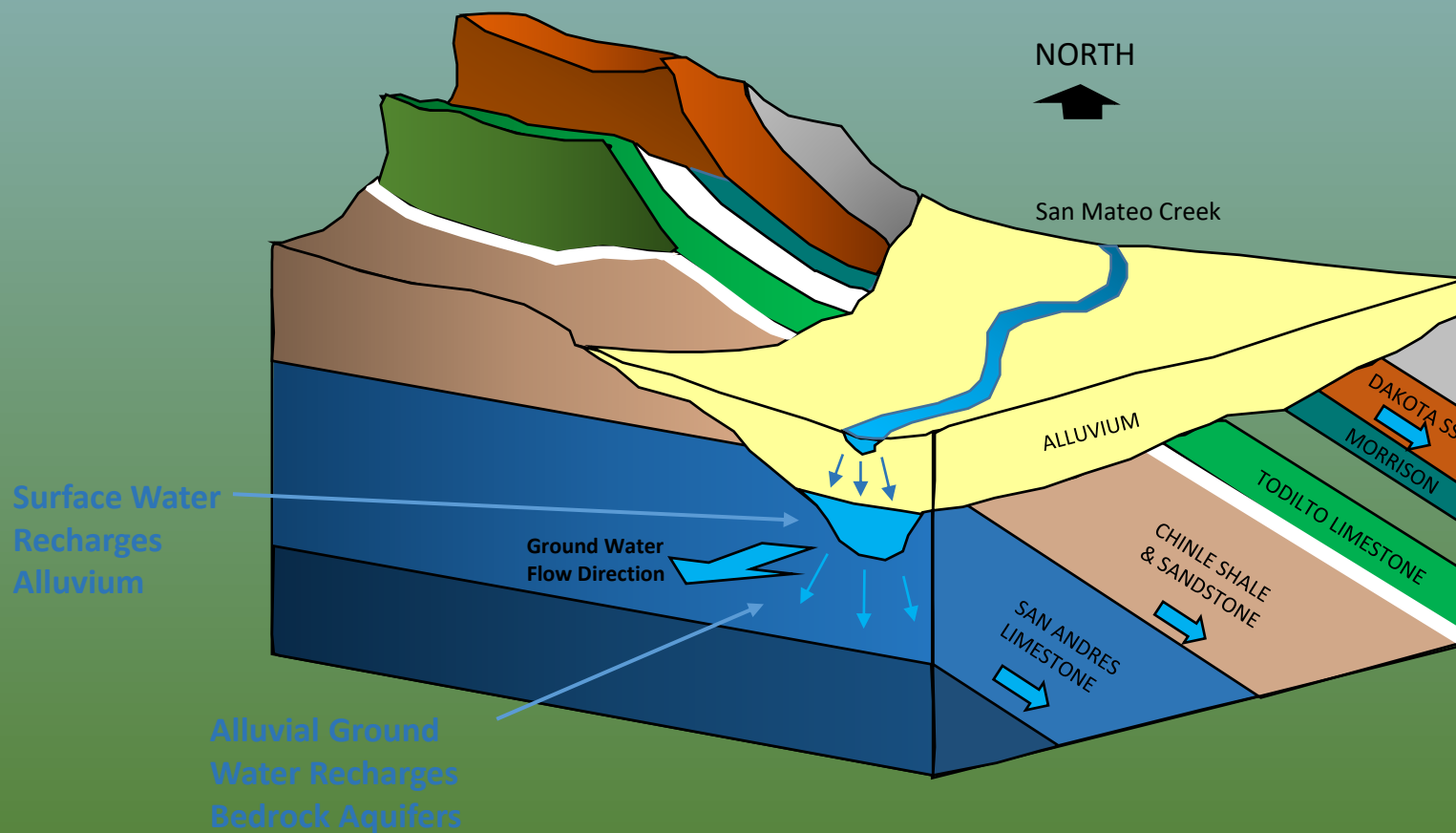
- **\$1.44M** - Total Spent through FY17
- FY15 & FY16 Total Approved Amounts - \$2.35M
- Project reviewed by Tronox Stakeholder Group

San Mateo Creek Basin Mine Discharge Water Impacts

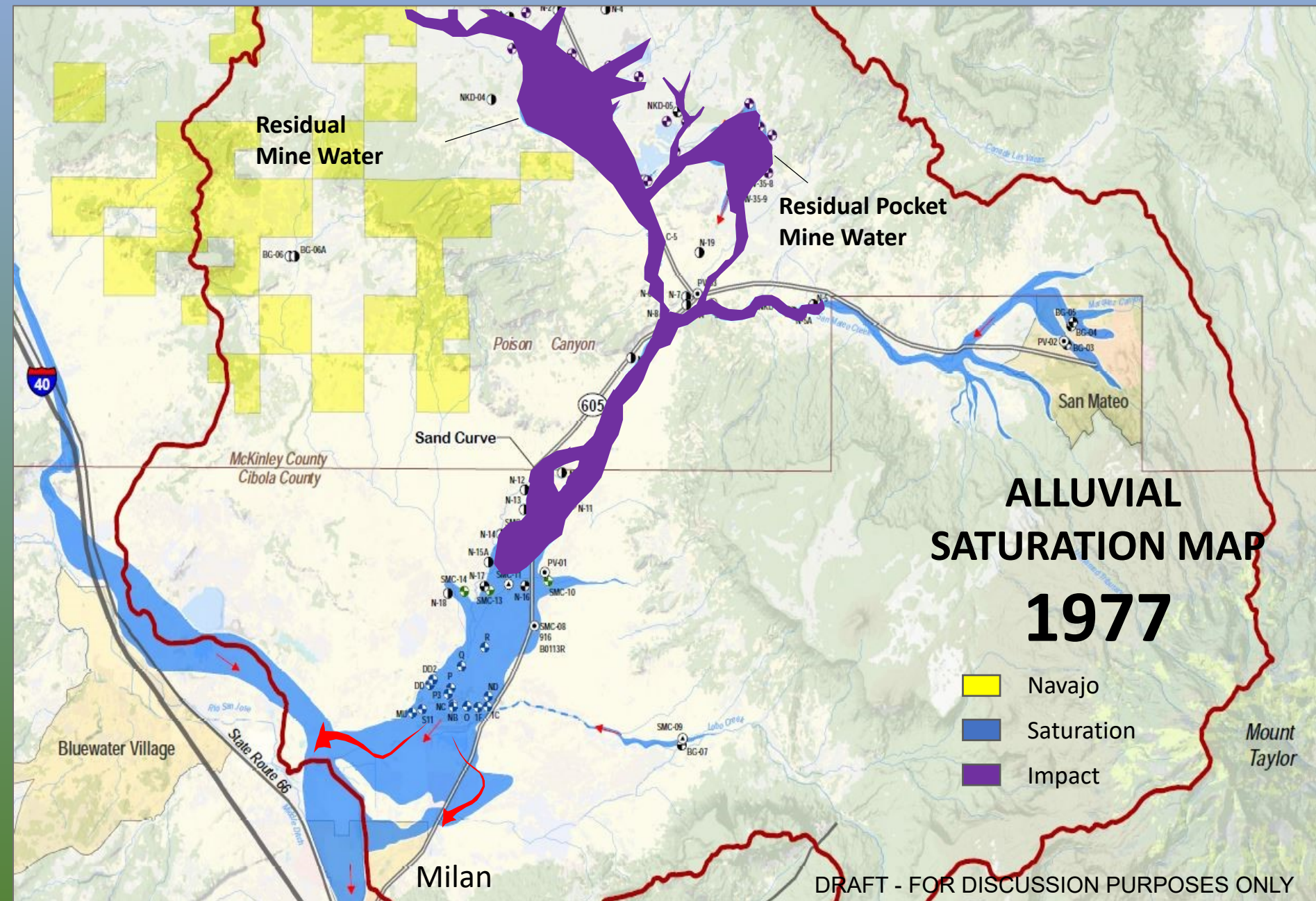


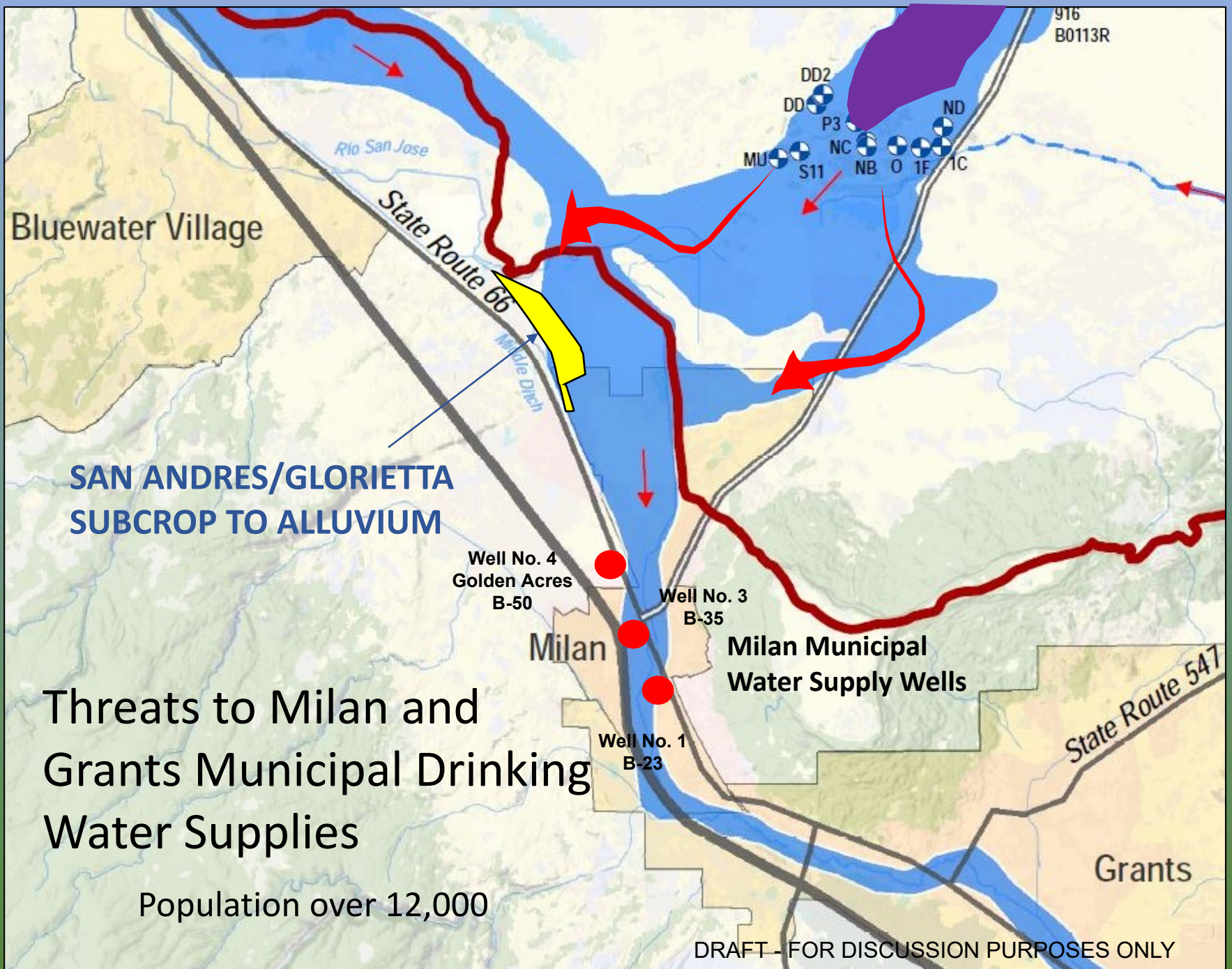
- Over 150 billion gallons discharged (1956 to 1982)
- High uranium, selenium, radium & gross-alpha
- Recharged Alluvial Aquifer on massive scale
- Recharged some bedrock aquifers
- Impacted private wells
- Threatens drinking water supplies

Conceptual Site Model – Ground Water

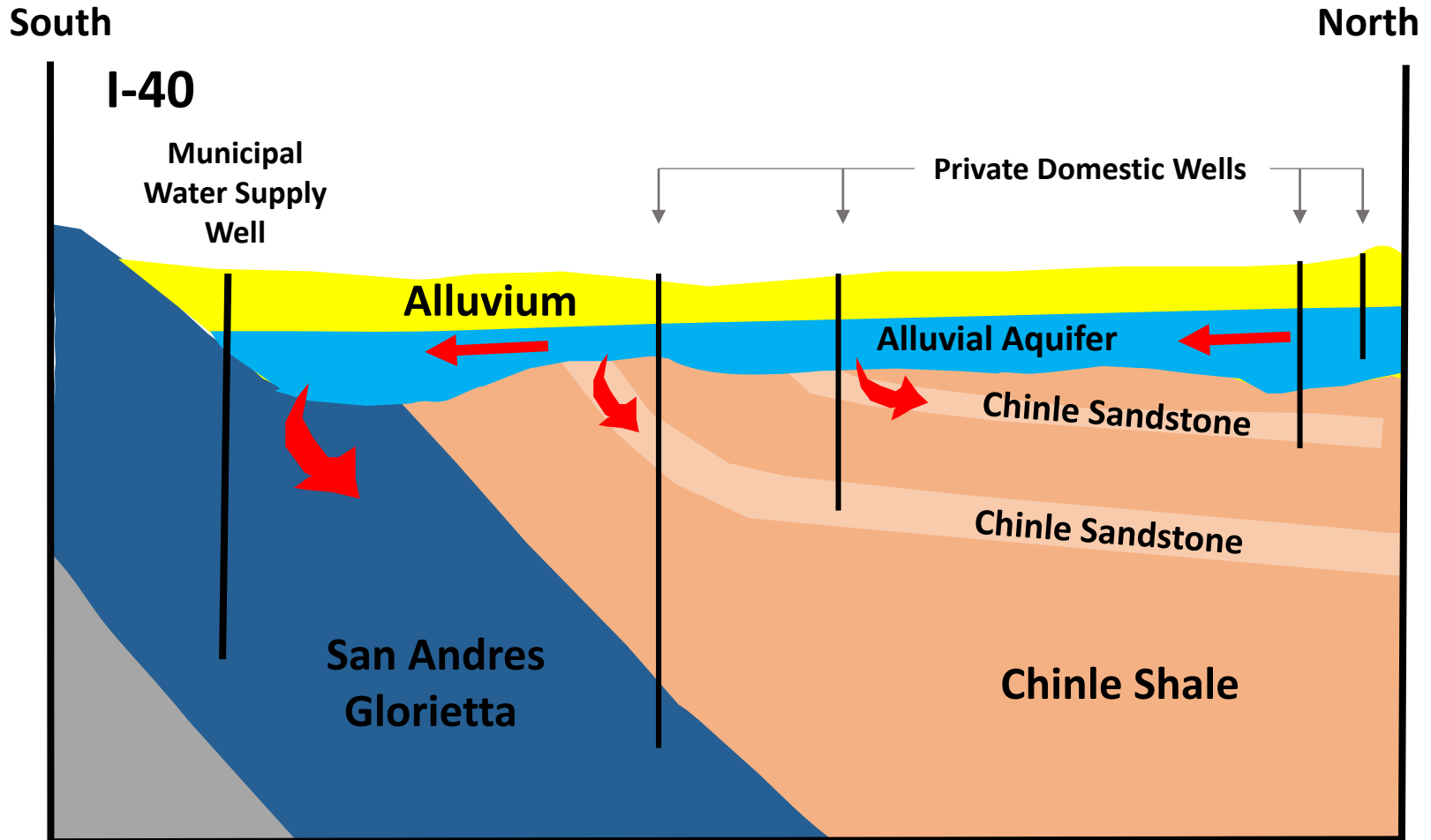


Mine Discharge Water Impacts





Generalized Geologic Cross Section Milan Area



Not to Scale

DRAFT - FOR DISCUSSION PURPOSES ONLY

SMCB Bedrock Drinking Water Aquifers



BEDROCK DRINKING WATER AQUIFERS

San Mateo Creek Basin Area

South

North

ZUNI UPLIFT

AMBROSIA LAKE VALLEY

Regional Aquifer for
Milan and Grants

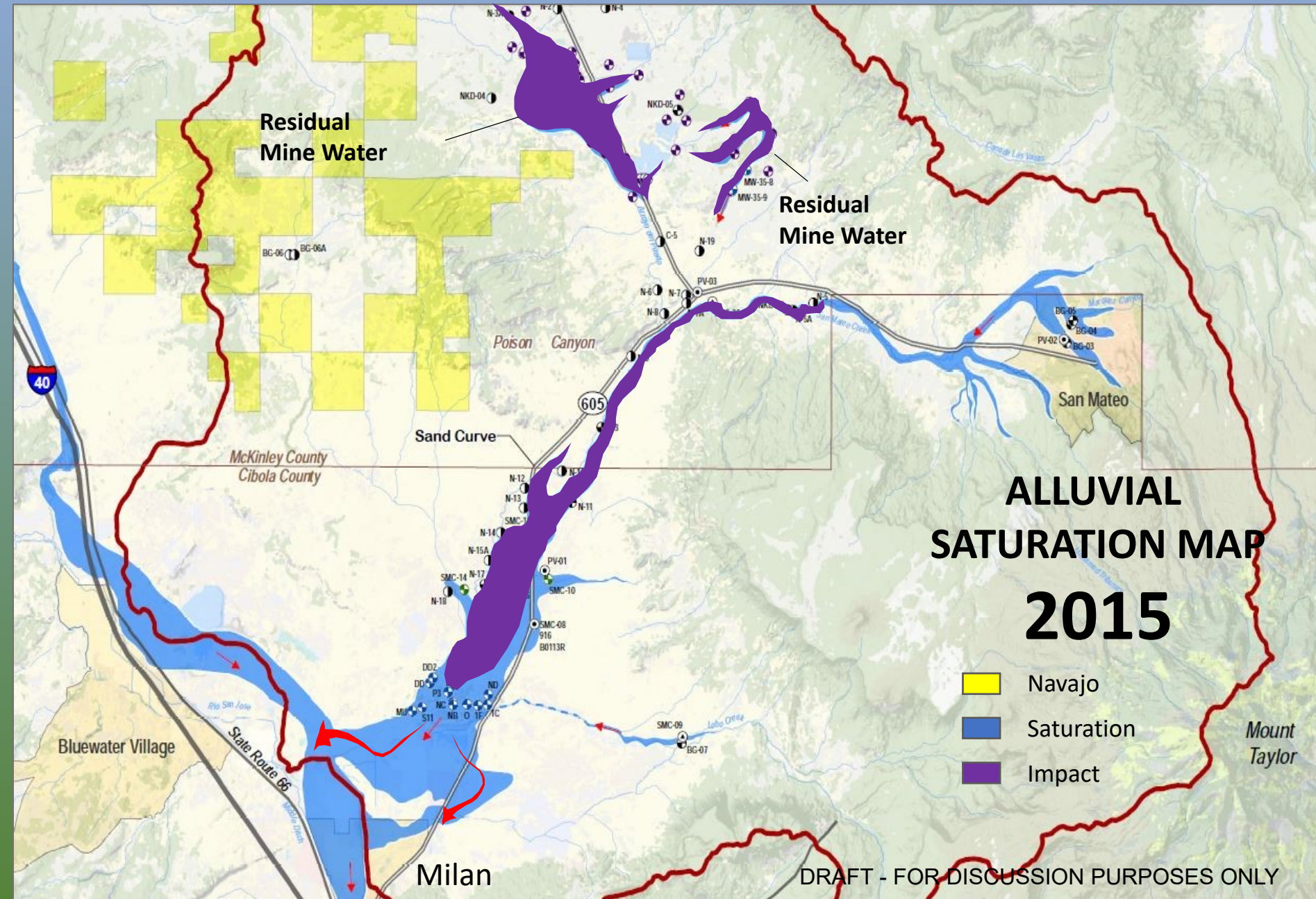


SMCB CERCLA Investigation



- Determined extent of Alluvial contamination
- Completed Dakota Sandstone Aquifer assessment
 - Significant areas remain dewatered
 - Mill contamination within NRC license boundary
- Identified need for further investigation of deeper aquifers
 - Protect natural resources

Mine Discharge Water Impacts



Mine Water Discharge Potential Health Risks



- Contamination up to 1100 ppb uranium in private wells
- Health risks include kidney disease and cancer
- Exposure routes are ingestion (drinking) and inhalation (showering)
- Provided 4 filtration systems and drilled 1 new well

Benefits of NPL Listing



- Ensures safe drinking water
- Provides comprehensive framework to address groundwater contamination
- Allows for multiple parties to participate in cleanup
- Leverages resources to address contamination (Federal and private)

San Mateo Basin Community Outreach



- Community outreach integral part of CERCLA
- Consultation with Navajo, Laguna and Acoma (February 2018)
- State of New Mexico (January 2018)
- City of Grants, Village of Milan (January 2018)
- Counties of McKinley and Cibola (January 2018)
- Community meetings (June/July 2018)

Questions



- Contact Information:

Kevin Shade

EPA R6 Grants Mining District Coordinator

214-665-2708

shade.kevin@epa.gov

Adam Weece

EPA R6 Community Involvement Coordinator

214-665-2264

Weece.adam@epa.gov

Brenda Cook

EPA R6 National Priorities List Coordinator

214-665-7436

cook.brenda@epa.gov

DRAFT - FOR DISCUSSION PURPOSES ONLY

OTHER SLIDES

HRS and Site Assessment Process



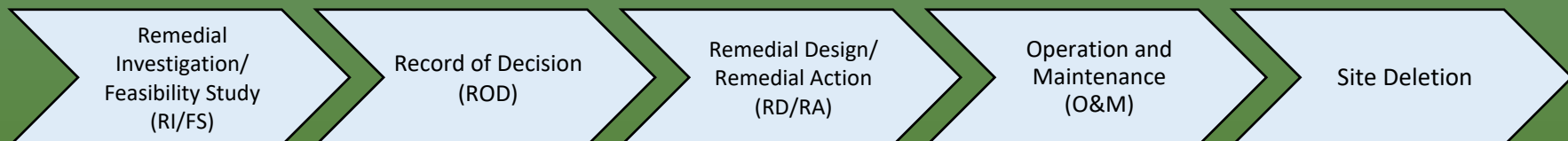
Site Assessment Phase



NPL Listing Process



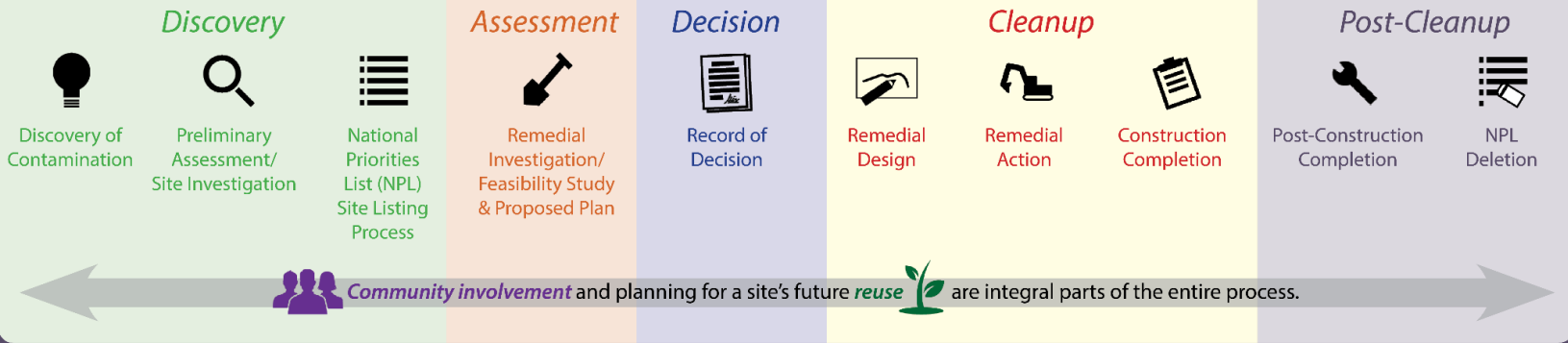
Remedial Phase



Overview of the Superfund Remedial Process (Long Term Cleanups)



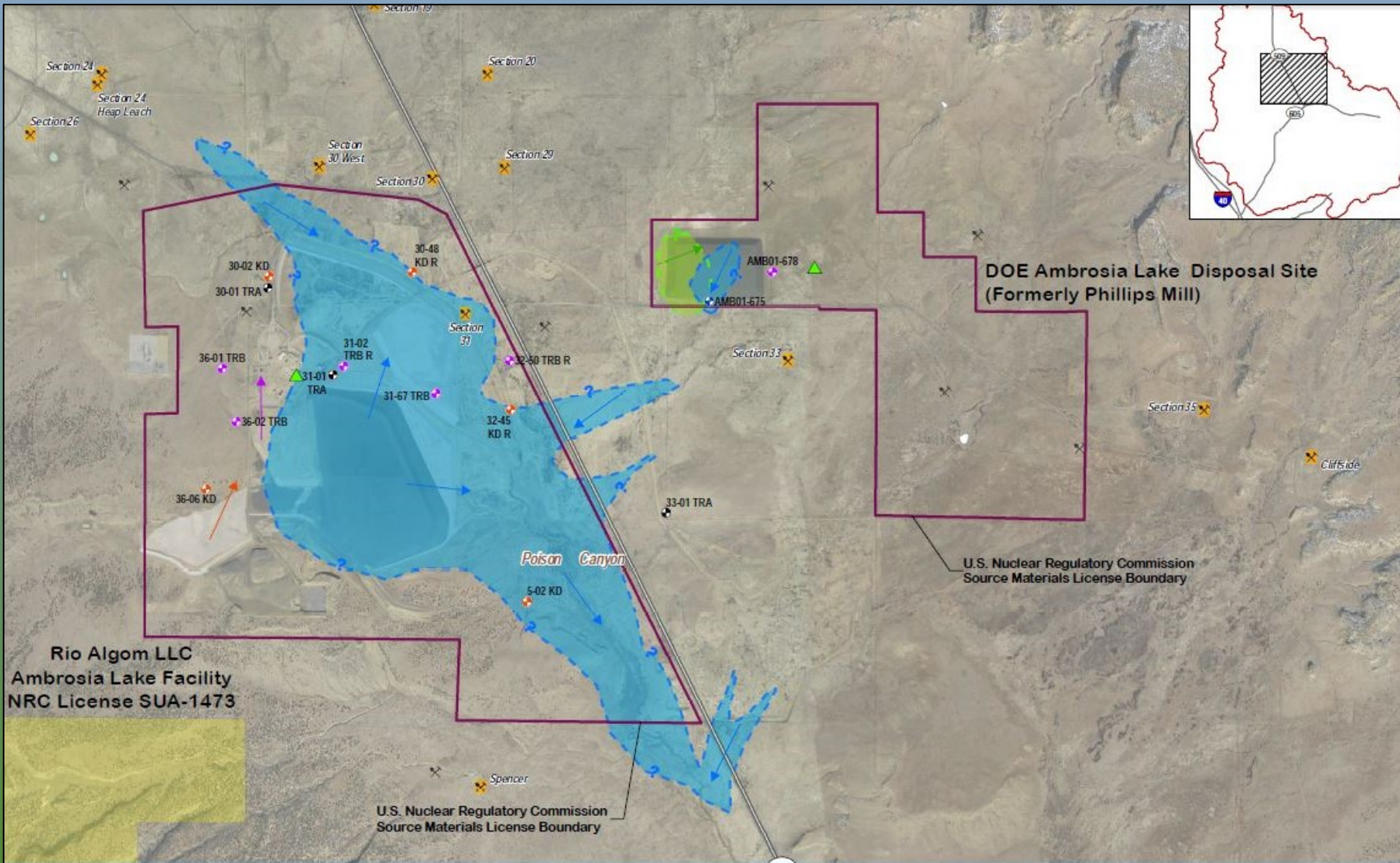
THE SUPERFUND PROCESS



Community Involvement and Superfund Reuse are integral components at every step in the Superfund Process

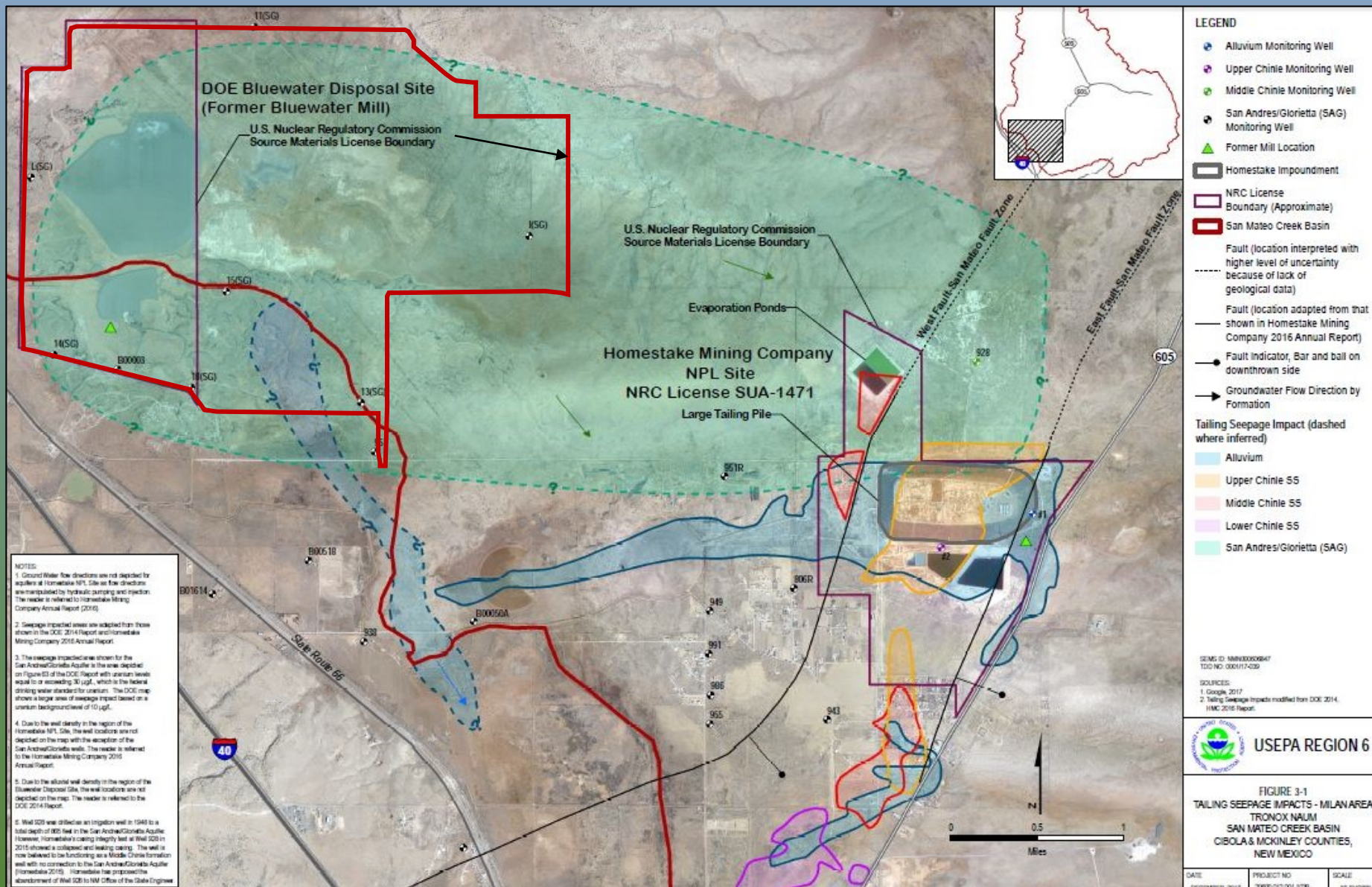
Tailing Seepage Impacts Map

Ambrosia Lake Area



Tailing Seepage Impacts Map

Milan Area



GENERALIZED CROSS SECTION B-B' AMBROSIA LAKE AREA

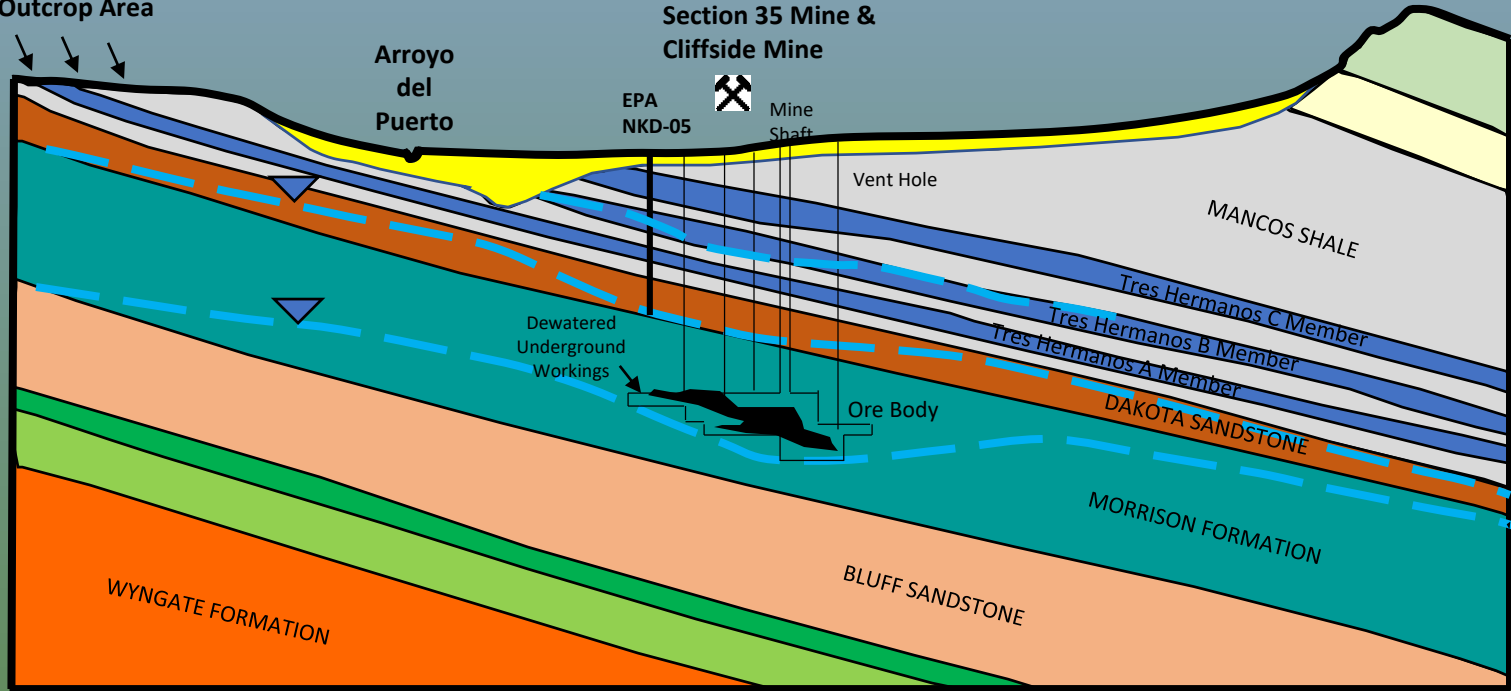
B

South

B'

North

Ground Water Recharge
in Outcrop Area



Modified from Kerr McGee Nuclear Corporation, 1980

Not to Scale



Estimated Water Level

Draft – For Discussion Purposes Only

Defining the NPL Site



- Mine Water Discharge from Wet Mines primary source
- Four Mine Water Discharge Systems that received discharge from seventeen wet mines and four ion-exchange plants
- Documented points of discharge from Johnny M and Mt. Taylor Mine Ponds
- Seven wet mines which discharged to San Mateo Creek.
- Mills are currently not being evaluated as part of the potential NPL site

Impacts of Mine Water Discharge: CERCLA Investigations



- March 2008 NMED completes PA of San Mateo Creek Basin
- January 2009 NMED issues health advisory for private wells
- 2009/2010 NMED conducts Pre-CERCLIS screens
- August 2010 First GMD 5-year plan includes impacts to GW
- 2010/2011 R6 conducts sampling at 9 mines (2 Tronox mines)
- 2012-2016 R6 conducts Phase I Ground Water Investigation
- 2015-2016 Region 6 conducts Phase II Ground Water Investigation

San Mateo Creek Basin CERCLA Investigations



- Documented contamination of the shallow aquifer
- Uranium/gross alpha present in private drinking water wells above drinking water standards
- Shallow aquifer in direct contact with multiple deeper aquifers
- Migration of hazardous substances to underlying aquifers
- Hazardous substances potentially impact public water supplies

Dakota Saturation Map

